**SCHOOL #\_\_\_\_\_\_\_\_\_\_\_ SCHOOL Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**STUDENT NAMES: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Part 1. Question and Answer (85% of overall score) Mark an “X” to choose your multiple-choice answers. Write all other answers in legibly in the space provided. Erase all unwanted marks or they could be counted against your score.**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | a.\_\_\_\_\_\_\_\_ | b. \_\_\_\_\_\_\_\_\_ \_ | | c. \_\_\_\_\_\_\_\_\_\_ | | d.\_\_\_\_\_\_\_\_\_\_ |  |
|  | a\_\_\_\_\_\_\_\_\_ | b. \_\_\_\_\_\_\_\_\_\_ | | c. \_\_\_\_\_\_\_\_\_\_ | | d.\_\_\_\_\_\_\_\_\_\_ |  |
|  | a.\_\_\_\_\_\_\_\_\_\_ | b. \_\_\_\_\_\_\_\_\_\_ | | c. \_\_\_\_\_\_\_\_\_\_ | | d.\_\_\_\_\_\_\_\_\_\_ |  |
|  | a. \_\_\_\_\_\_\_\_\_\_ | b. \_\_\_\_\_\_\_\_\_\_ | | c. \_\_\_\_\_\_\_\_\_\_ | | d.\_\_\_\_\_\_\_\_\_\_ |  |
|  | a. \_\_\_\_\_\_\_\_\_\_ | b. \_\_\_\_\_\_\_\_\_\_ | | c. \_\_\_\_\_\_\_\_\_\_ | | d.\_\_\_\_\_\_\_\_\_\_ |  |
|  | a. \_\_\_\_\_\_\_\_\_\_ | b. \_\_\_\_\_\_\_\_\_\_\_ | | c. \_\_\_\_\_\_\_\_\_\_ | | d.\_\_\_\_\_\_\_\_\_\_ |  |
|  | a. \_\_\_\_\_\_\_\_\_\_ | b. \_\_\_\_\_\_\_\_\_\_ | | c. \_\_\_\_\_\_\_\_\_\_ | | d.\_\_\_\_\_\_\_\_\_\_ |  |
|  | a. \_\_\_\_\_\_\_\_\_\_ | b. \_\_\_\_\_\_\_\_\_\_ | | c. \_\_\_\_\_\_\_\_\_\_ | | d.\_\_\_\_\_\_\_\_\_\_ |  |
|  |  | | | | | | Write your answer in space |
|  |  | | | | | | Write your answer in space |
|  |  | | | | | | Write your answer in space |
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|  |  | | | | | | Write your answer in space |
|  | a. \_\_\_\_\_\_\_\_\_\_ | b. \_\_\_\_\_\_\_\_\_\_ | | c. \_\_\_\_\_\_\_\_\_\_ | | d. \_\_\_\_\_\_\_\_\_\_ |  |
|  | a. \_\_\_\_\_\_\_\_\_\_ | b. \_\_\_\_\_\_\_\_\_\_ | | c. \_\_\_\_\_\_\_\_\_\_ | | d. \_\_\_\_\_ \_\_\_\_ |  |
|  | a. \_\_\_\_\_\_\_\_\_\_ | b. \_\_\_\_\_\_\_\_\_\_ | | c. \_\_\_\_\_\_\_\_\_\_ | | d. \_\_\_\_\_\_\_\_\_\_ |  |
|  | a. \_\_\_\_\_\_\_\_\_\_ | b. \_\_\_\_\_\_\_\_\_\_ | | c. \_\_\_\_\_\_\_\_\_\_ | | d. \_\_\_\_\_\_\_\_\_\_ |  |
|  | a. \_\_\_\_\_\_\_\_\_\_ | b. \_\_\_\_\_\_\_\_\_\_ | | c. \_\_\_\_\_\_\_\_\_\_ | | d. \_\_\_\_\_\_\_\_\_\_ | e. \_\_\_\_\_\_\_\_\_\_ |  |
|  | a. \_\_\_\_\_\_\_\_\_\_ | b. \_\_\_\_\_\_\_\_\_\_ | | c. \_\_\_\_\_\_\_\_\_\_ | | d. \_\_\_\_\_\_\_\_\_\_ |  |
|  | a. \_\_\_\_\_\_\_\_\_\_ | b. \_\_\_\_\_\_\_\_\_\_ | | c. \_\_\_\_\_\_\_\_\_\_ | | d. \_\_\_\_\_\_\_\_\_\_ | e. \_\_\_\_\_\_\_\_\_\_ |  |
|  | a. \_\_\_\_\_\_\_\_\_\_ | b. \_\_\_\_\_\_\_\_\_\_ | | c. \_\_\_\_\_\_\_\_\_\_ | | d. \_\_\_\_\_\_\_\_\_\_ |  |
|  | a. \_\_\_\_\_\_\_\_\_\_ | b. \_\_\_\_\_\_\_\_\_\_ | | c. \_\_\_\_\_\_\_\_\_\_ | | d. \_\_\_\_\_\_\_\_\_ |  |
|  | a. \_\_\_\_\_\_\_\_\_\_ | b. \_\_\_\_\_\_\_\_\_\_ | | c. \_\_\_\_\_\_\_\_\_\_ | | d. \_\_\_\_\_\_\_\_\_ |  |
|  | a. \_\_\_\_\_\_\_\_\_\_ | b. \_\_\_\_\_\_\_\_\_\_ | | c. \_\_\_\_\_\_\_\_\_\_ | | d. \_\_\_\_\_\_\_\_\_\_ |  |
|  | a. \_\_\_\_\_\_\_\_\_\_ | b. \_\_\_\_\_\_\_\_\_\_ | | c. \_\_\_\_\_\_\_\_\_\_ | | d. \_\_\_\_\_\_\_\_\_\_ |  |
|  | a. \_\_\_\_\_\_\_\_\_\_ | b. \_\_\_\_\_\_\_\_\_\_ | | c. \_\_\_\_\_\_\_\_\_\_ | | d. \_\_\_\_\_\_\_\_\_\_ |  |
|  | a. \_\_\_\_\_\_\_\_\_\_ | b. \_\_\_\_\_\_\_\_\_\_ | | c. \_\_\_\_\_\_\_\_\_\_ | | d. \_\_\_\_\_\_\_\_\_\_ |  |
|  | a. \_\_\_\_\_\_\_\_\_\_ | b. \_\_\_\_\_\_\_\_\_\_ | | c. \_\_\_\_\_\_\_\_\_\_ | | d. \_\_\_\_\_\_\_\_\_\_ |  |
|  |  | | | | | | Write your answer in space provided |
|  | a. \_\_\_\_\_\_\_\_\_\_ | b. \_\_\_\_\_\_\_\_\_\_ | | c. \_\_\_\_\_\_\_\_\_\_ | | d. \_\_\_\_\_\_\_\_\_ |
|  |  | | | | | | Write your answer in space |
|  | a. \_\_\_\_\_\_\_\_\_\_ | b. \_\_\_\_\_\_\_\_\_\_ | | c. \_\_\_\_\_\_\_\_\_\_ | | d. \_\_\_\_\_\_\_\_\_\_ |  |
|  | a. \_\_\_\_\_\_\_\_\_\_ | b. \_\_\_\_\_\_\_\_\_ | | c. \_\_\_\_\_\_\_\_\_\_ | | d. \_\_\_\_\_\_\_\_\_\_ |  |
|  | a.\_\_\_\_\_\_\_ e. \_\_\_\_\_\_\_\_\_ i. \_\_\_\_\_\_\_\_\_  b.\_\_\_\_\_\_\_ f. \_\_\_\_\_\_\_\_\_ j. \_\_\_\_\_\_\_\_\_  c.\_\_\_\_\_\_\_ g. \_\_\_\_\_\_\_\_\_  d.\_\_\_\_\_\_\_ h. \_\_\_\_\_\_\_\_\_ | | | | | | | |
|  | a.\_\_\_\_\_\_\_ | b.\_\_\_\_\_\_ | c.\_\_\_\_\_\_\_ | | d.\_\_\_\_\_\_ | e.\_\_\_\_\_\_ | f.\_\_\_\_\_\_\_ | g.\_\_\_\_\_\_\_ |  |
|  | a.\_\_\_\_\_\_\_ | b.\_\_\_\_\_\_ | c.\_\_\_\_\_\_\_ | | d.\_\_\_\_\_\_ | e.\_\_\_\_\_\_ | f.\_\_\_\_\_\_\_ | g.\_\_\_\_\_\_\_ |
|  | a.\_\_\_\_\_\_\_ | b.\_\_\_\_\_\_ | c.\_\_\_\_\_\_\_ | | d.\_\_\_\_\_\_ | e.\_\_\_\_\_\_ | f.\_\_\_\_\_\_\_ | g.\_\_\_\_\_\_\_ |
|  | a.\_\_\_\_\_\_\_ | b.\_\_\_\_\_\_ | c.\_\_\_\_\_\_\_ | | d.\_\_\_\_\_\_ | e.\_\_\_\_\_\_ | f.\_\_\_\_\_\_\_ | g.\_\_\_\_\_\_\_ |
|  |  | | | | | | | |

**Part 2. Calorimetry Experiment (15% of overall score)**

Each student team is provided with Cheetos. Make sure you are following safe lab procedures. Clean up your station.

Using your student-built, non-electric calorimeter, determine the energy content of Cheetos.

Provide your answer in Calories/gram. Show your work for maximum credit.

Your Calorimetry unit efficiency

Please explain what experiment did you perform (at home/school) to arrive at this efficiency value (3 pts)

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

CALORIMETRY ( 8pts)

Water volume Water weight ­

Sample initial weight Water initial temperature

Sample final weight Water final temperature

Sample weight change Water temperature change

Heat capacity of water = 1 calorie/gram \* °C

**Energy content of Cheetos** (4 pts including work)

**Show your work here:**